LED level meter driver, 5-point, linear scale

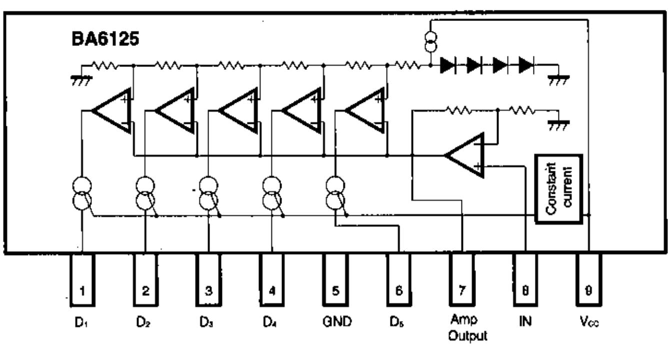
BA6125

The BA6125 is a driver IC for LED VU level meters in stereo equipment and other display applications.
The IC displays the input level on five LEDs. The display level range is 35mVrms to 175mVrms in five equally-spaced 35mVrms steps.
The BA6125 includes a rectifier amplifier allowing direct AC input, and has constant-current outputs, so it can directly drive the LEDs without variations in LED current due to supply voltage fluctuations.

●Applications
Parity checkers, signal meters, and other display devices.

●Features
1) Rectifier amplifier allows either AC or DC input.
2) Constant-current outputs for constant LED current when the supply voltage fluctuates.
3) Built-in reference voltage means that power supply voltage fluctuations do not effect the display.
4) Wide operating voltage range (3.5V to 16V) for a wide range of applications.
5) Low PCB space requirements. Comes in a compact 9-pin SIP package and requires few external components.

●Block diagram



●Absolute maximum ratings (Ta = 25℃)

Parameter	Symbol	Limits	Unit
Supply voltage	V_{CC}	18	V
Power dissipation	Pd	800*	mW
Operating temperature	Topr	−25~60	℃
Storage temperature	Tstg	−55~125	℃
Junction temperature	Tj	150	℃

* Reduced by 6.4mW for each increase in Ta of 1°C over 25°C.

●Electrical characteristics (unless otherwise specified Ta = 25℃, V_{CC} = 6.0V, and f = 1kHz)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions	Measurement Circuit
Operating voltage range	V_{CC}	3.5	6	16	V	−	Fig.1
Quiescent current	I_Q	−	5	8	mA	V_{IN}=0V	Fig.1
Sensitivity	V_{IN}	−	105	−	mV_{rms}	V_{C3} on level	Fig.1
Control level 1	V_{C1}	−	$1/3V_{C3}$	−	mV_{rms}	−	Fig.1
Control level 2	V_{C2}	−	$2/3V_{C3}$	−	mV_{rms}	−	Fig.1
Control level 3	V_{C3}	−	V_{C3}	−	mV_{rms}	Adjustment point	Fig.1
Control level 4	V_{C4}	−	$4/3V_{C3}$	−	mV_{rms}	−	Fig.1
Control level 5	V_{C5}	−	$5/3V_{C3}$	−	mV_{rms}	−	Fig.1
LED current	I_{LED}	11	15	18.5	mA	−	Fig.1
Input bias current	I_{INO}	−	0.3	1.0	μA	−	Fig.1

●Measurement circuit

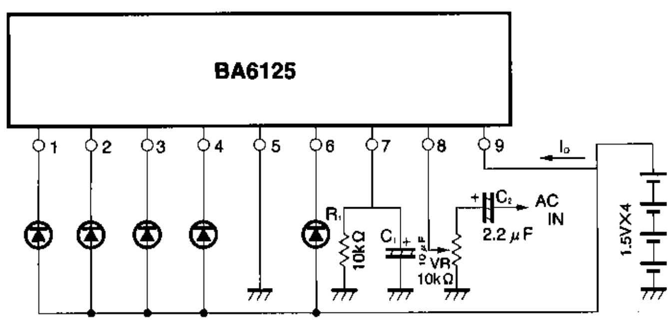


Fig. 1

●Application example

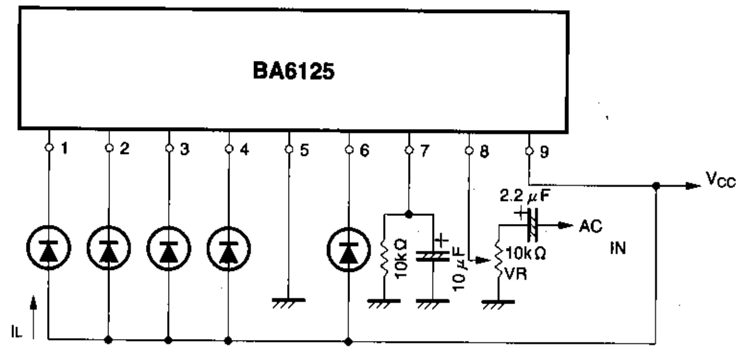


Fig. 2

●Application example

The response time (attack and release time) can be changed by varying the values of C_1 and C_2.

C_2 is a coupling capacitor, and the potentiometer VR varies the input level. Input the voltage level that you desire for the center point, and adjust the potentiometer so that the third LED (V_{C3}) lights.

To reduce the LED current, connect a resistor either in parallel (Fig. 3 (1)) or in series (Fig. 3 (2)) with the LED. If a resister is connected in series with the LED, the LED current will change if the supply voltage fluctuates.

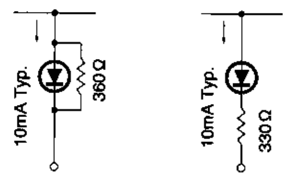


Fig. 3

Note: If the power supply voltage exceeds 9V, insert a resistor in series with the LED current supply line, or connect a heat sink so that the maximum power dissipation Pd Max. is not exceeded (see Fig. 4).

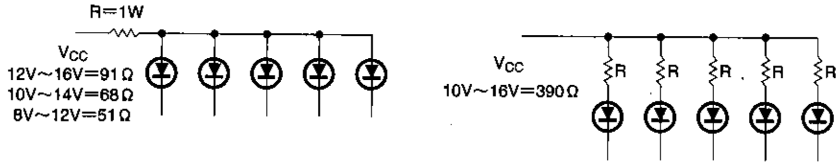


Fig. 4

●Use with DC input

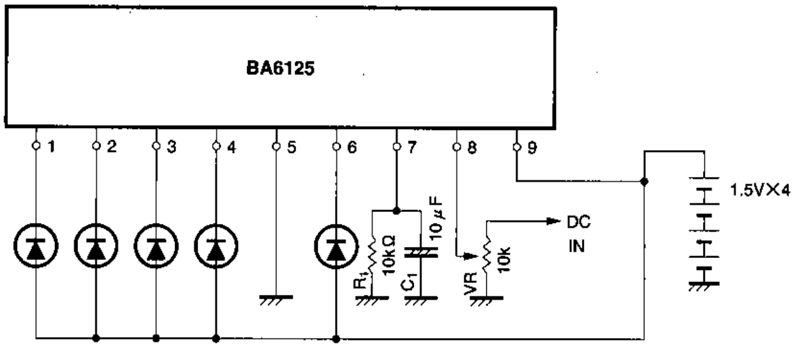


Fig. 5

Use the potentiometer shown in Fig. 5 to adjust the input level. Adjust the potentiometer so that the third LED (V_{C3}) lights for the desired input level.
For large input levels, input via pin 7 is also possible. In this case, the dispersion in comparator level is less than in the case of input via pin 8. Note that, if the resistance value of the 100kΩ potentiometer shown in Fig. 6 is made too small, the discharge time constant determined by C_1 and R_1 will change, and the response time will vary. The maximum input level for pin 7 is 5V.

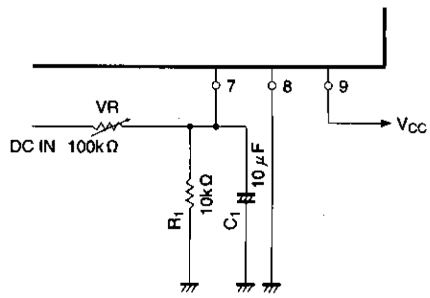
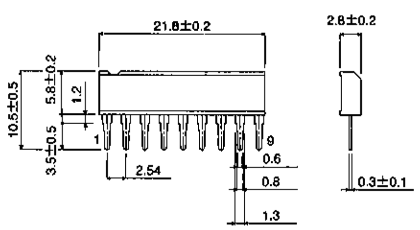


Fig. 6

Comparator level	V_{C1}	V_{C2}	V_{C3}	V_{C4}	V_{C5}	Unit
Pin 7 input (typ.)	0.4	0.8	1.2	1.6	2.0	V

●External dimensions (Unit: mm)



SIP9